

**Ferns—Fact and Fancies About Them—IV**

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To turn now to the more practical part of our subject—let us see how we can be certain that a plant is really a true fern, and not a fern-like flowering plant. There are three essential things to remember about the ferns. Leaves or fronds and also roots spring directly from root stems, young fronds are coiled up or circinate, as it is called, in the bud, and they bear spores instead of seeds. Everyone is familiar with uncoiling fern fronds in spring. Mrs. Parsons quotes someone as saying that there is nothing in nature which looks “more aggressively new than a young fern.” This seems to apply particularly to those whose tightly coiled croziers emerge in soft scales or wool of the most delicate shades. I have in my garden an Interrupted Fern, *Osmunda Claytoniana*, one of the earliest arrivals each spring, which comes clothed in pure white wool just slightly flecked here and there with pale golden brown, the light bright green of the stipes or stem peeping through. For some days it is by far the daintiest thing in the garden. This wool falls off as the fronds grow larger, and is said to be eagerly sought by small birds to felt their nests with. The sturdy Royal Fern, *Osmunda regalis*, also looks young and lovely in pink or pale wine color. But the smooth glossy green of the Lady Fern and some others is less attractive.

The coiled-up condition of the young fronds is one great peculiarity of true ferns. The Botrychiums, Grape ferns, or Moonworts are only fern allies, and they are folded, not coiled, in the bud. In true ferns the smallest pinnules or divisions of each frond are coiled up toward the next larger, and that again toward the midrib. Some

ferns uncoil quickly, others continue to uncurl and grow from the tip indefinitely. A *Lygodium* or climbing fern is reported from Jamaica one hundred feet long, and still growing. We all know how persistently our Boston Fern remains curled at the tips as it continues to grow, and how careful one must be to protect those tips from injury. If the end of a fern frond is injured the frond stops growing. It may remain green for a long while but it grows no more, and the tip burns brown and unsightly.

In all true ferns the stem or stipe of each frond grows separately directly out from a rootstock. This is true even of the tree ferns. Most of our ferns have subterranean rootstocks while those of the tree ferns are aerial, taking the place of tree trunks, not tapering, however, like trees, but the same size all the way up, and topped by crowns of huge fronds. The sides are covered by brown scales and are often hung with numerous roots.

Rootstocks are, roughly speaking, of two widely different sorts called, respectively, caudex and rhizome. A caudex is roundish, short and thick, bearing its fronds in tufts or circles, while the roots grow in a tassel-like bunch. The rhizome on the contrary may be long and cord-like, growing rapidly, sometimes on the surface, but usually underground; sometimes even very deep down, and on the under side is a fringe of rootlets. On this kind of root stem every few inches, more or less according to the kind of fern, a bud will appear upon the upper part. Below this the roots grow more thickly, the bud develops into a frond and becomes a new plant. This is the manner of growth of the Hay-scented Fern or *Dicksonia* which covers so thickly many country roadsides; so also the brake which is a vigorous grower, allowing almost nothing to impede it. It has been known to go down as many as fifteen feet to get round a stone in its

way and then come up on the other side. Ferns with the short rootstocks throw out new crowns occasionally, but increase much more slowly. When they carry their fronds in circles like the Marginal Shield Fern the new fronds always grow out from the center and can be seen several months in advance coiled up and covered up with soft brown scales all ready for the following spring.

But the sporangia or groups of spore cases are the most characteristic and most important thing about the ferns. These are to be found, in the majority of ferns, on the under side, or sometimes on or close to the edges, and also sometimes, though very rarely, on the upper side of an ordinary leaf. Fronds bearing spores are called fertile, those without are sterile fronds. Those little groups of spore cases, called sporangia, are in different positions, and of different shapes, and help to identify genera. On examining fronds of our ordinary wild ferns, either freshly gathered or pressed specimens, it will be seen that these little groups, fruit dots as they are sometimes called, vary very much. On our common Polypody, known to everyone, they are round, conspicuous, yellow or bright yellowish brown when ripe, and often so large that the two rows almost cover the pinules or leaf divisions on which they grow. On other species, the spinulose or Lace Fern of the florist for instance, they are small and dainty, while on the Marginal Shield Fern they grow close to the edge as the name implies. Again on another genus, the spleenworts, these fruit dots are not round but elongated. On the Woodwardias or Chain ferns they are also elongated and grow in rows end to end close to the midrib, thus forming little chains. In still others the fertile fronds are contracted, entirely or in part, and may be quite unlike the sterile fronds. Our Christmas Fern, so-called because it remains green through the winter and is much used by

florists at Christmas time, has the tip or apex of the fertile frond so contracted that it bears in some places the name of dagger fern.

The fertile fronds of the so-called "flowering ferns" are all very peculiar and puzzling to beginners until familiar with them. The Cinnamon Osmunda, for instance, bears in June within a circle of broad bright green sterile leaves a number of spikes of brilliant cinnamon colored spore cases, looking at a short distance exactly like clusters of tiny flowers. Again the Onocleas have spikes of tiny rolled up pinnules which inclose the spore cases, and which turn brown when ripe and resemble clusters of little nuts or seed vessels. The fertile fronds of the Ostrich Fern instead of being taller than the sterile ones, as is usually the case, are much shorter, only one quarter or a third as high, are rigid and upright and look much like dilapidated wornout quill feathers which some say gives the fern its name. But the green sterile leaves are also feather-like. Gather one when you have opportunity and place it in a vase of water. It will not live more than an hour or two, but will not shrivel up as so many do. Notice how gracefully the tip soon begins to droop and curl until it looks for all the world like a lovely green ostrich plume.

CAMBRIDGE, MASS.

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### Notes on American Ferns—XX<sup>1</sup>

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*CHEILANTHES ALABAMENSIS* (Buckl.) Kunze.—Though correctly ascribed to Arizona on the basis of specimens collected in the Huachuca Mountains by Lemmon in

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<sup>1</sup> Published by permission of the Secretary of the Smithsonian Institution.